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The EPA's Proposed Ethanol Mandates for 2014, 2015, and 2016: Is There a 'Push' or Not?

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On May 29, 2015, the EPA announced the long-awaited RFS standards for 2014, 2015 and 2016 and the biomass-based diesel volume for 2017. As outlined in a *farmdoc daily* article last week (May 28, 2015), market expectations for the proposal were: i) relatively large biomass-based diesel mandates; and ii) ethanol mandates above the E10 blend wall but not returning immediately to statutory levels. These expectations were reflected in RINs market prices last week. The proposal largely confirmed expectations for biomass-based diesel ("biodiesel") but did not appear to do so for ethanol. The EPA retained the highly controversial "inadequate domestic supply" waiver arguments that first appeared in November 2013, and based on this waiver argument, proposed reductions in the renewable (ethanol) mandates for 2014-2016 compared to levels specified in the RFS statutes. Criticism from ethanol supporters was swift and severe. For example, Chip Bowling, president of the National Corn Growers Association, made this statement *shortly after release of the EPA proposal, "*We are evaluating our legal options for defending the law and protecting the rights of farmers and consumers. We will fight to protect and build profitable demand for corn, which is of fundamental interest to NCGA and our farmers."

In light of this criticism, it is interesting to consider how the EPA characterizes the standards in the proposal:

> *"Our proposal includes volumes of renewable fuel that will require either ethanol use at levels significantly beyond the level of the E10 blendwall, or significantly greater use of non-ethanol renewable fuels than has occurred to date, depending on how the market responds to the standards we set. The standards we are proposing for 2015 and 2016 in particular would drive growth in renewable fuels by providing appropriate incentives to overcome current constraints and challenges to further the goals of Congress in establishing the RFS program. The approach we propose taking for 2015 and 2016 is forward-looking and consistent with the purpose of the statute to significantly increase the amount of renewable fuel used as transportation fuel over time, particularly renewable fuels with the lowest lifecycle GHG emissions, in the transportation fuel supply." (p.7)*

It is particularly striking that the EPA claims the proposed ethanol mandates are high enough to require levels of ethanol use beyond the E10 blend wall or the use of significantly more non-ethanol biofuels. This

is the "push" that was implicit in the RFS standards when passed by the U.S. Congress. The purpose of today's article is to examine whether this claim by the EPA is supported by the data. More specifically, we review the methodology used by the EPA to formulate the ethanol mandates for 2014-2016 and then analyze whether the proposed mandates are likely to provide incentives for ethanol use beyond the E10 blend wall or significantly higher use of non-ethanol biofuels. Our previous work on implementation of the RFS in light of the challenges presented by the E10 blend wall can be found in several *farmdoc daily* articles (May 24, 2012; September 26, 2012; November 2, 2012; February 13, 2013; April 10, 2013; September 5, 2013; December 4, 2013; February 19, 2015).

Background

The RFS statutes required the EPA to establish biofuel volume requirements in four categories for each year from 2008 through 2022: cellulosic biofuel, biomass-based diesel, total advanced biofuel (which includes biomass-based diesel), and renewable fuel. The difference between the total advanced mandate and the total of the cellulosic and biodiesel mandate is referred to as the undifferentiated advanced mandate and can be satisfied by a combination of qualified advanced biofuels. Renewable biofuels is generally assumed to be corn-based ethanol but this is actually not explicitly required by the RFS legislation. Instead, corn-based ethanol has been the cheapest alternative for this category that also meets the environmental requirements of the RFS. In addition, the renewable portion of the mandate can also be satisfied with discretionary blending of advanced biofuels, so we refer to the renewable mandate as an implied mandate. Cellulosic biofuels have been in very limited supply, so the EPA has written down the cellulosic mandate to very low levels relative to statutory levels each year. The biodiesel mandate was established as a minimum of one billion gallons per year from 2012 through 2022, with larger amounts subject to EPA approval.

The proposed standards announced by the EPA on May 29 are compared to statutory mandate levels in Table 1. Compared to the November 2013 preliminary rulemaking, the proposed standards for 2014 are larger for all categories, but below statutory levels for all but biomass-based diesel. As noted earlier, the EPA retained the waiver argument of insufficient supplies for renewable fuels, but increased the 2014 ethanol standard to 13.25 billion gallons, or 249 million gallons above the 13.01 billion gallons standard from the November 2013 preliminary rulemaking. The proposed ethanol standards for 2015 and 2016 are 13.4 and 14.0 billion gallons, respectively. These are again well below statutory levels. The only category for 2015 and 2016 that exceeds statutory levels is biomass-based diesel, which increases to 1.8 billion gallons in 2016 and 1.9 billion gallons in 2017 (the only category proposed for 2017).
The fact that ethanol (renewable) mandates were reduced below statutory levels in 2014-2016 does not necessarily imply that the proposed standards will not provide incentives to push ethanol use beyond the E10 blend wall. This obviously depends on the level of the E10 blend wall relative to the mandates in each year. We focus on this important comparison in the next section.

Table 1. RFS Volume Requirements for the U.S., 2014-2017

	RFS Statutory				EPA Preliminary Proposal			
Category	2014	2015	2016	2017	2014	2015	2016	2017
Cellulosic Biofuel	1.75	3.00	4.25	5.50	0.033	0.106	0.206	NA
Biomass-Based Diesel	>1	>1	>1	>1	1.63	1.70	1.80	1.90
Advanced Biofuel	3.75	5.50	7.25	9.00	2.68	2.90	3.40	NA
Total	18.15	20.50	22.25	24.00	15.93	16.30	17.40	NA
Implied Renewable Fuel	14.00	15.00	15.00	15.00	13.25	13.40	14.00	NA

Note: These volumes are stated in billion gallons of ethanol equivalents, except for biomass-based diesel which is stated in billion gallons of "wet" physical volume terms. NA stands for not applicable.

Ethanol Mandates and the Blend Wall

The data needed to analyze the "push" provided by the proposed EPA ethanol mandates for 2014-2016 are presented in Table 2. We begin with a discussion of the data in the EPA proposal, found in the second, third, and fourth columns. The EPA uses EIA projections of total gasoline use in the U.S. (48 continental states plus Hawaii). These projections, found in row (1) of Table 2, are 136.49, 138.37, and 137.58 billion gallons for 2014, 2015, and 2016, respectively. Note that gasoline use is projected to increase 1.4 percent in 2015 and then drop by 0.6 percent in 2016. The E10 blend wall (assuming no E0) is simply 10 percent of the gasoline totals. Total ethanol use, reported in row (3), is also projected by the EIA and the levels are 13.43, 13.36, and 13.46 billion gallons in 2014, 2015, and 2016, respectively. It is surprising to see ethanol use projected to drop in 2015 while total gasoline use is increasing. This leads to a decline in the ethanol inclusion rate (row (4)) from 9.84 percent in 2014 to 9.68 percent in 2015. It is not surprising that the ethanol inclusion rate does not reach 10 percent due to small amounts of E0 still in use in some areas of the U.S.

Table 2. U.S. Blend Wall Computations and EPA Proposed Ethanol Mandates, 2014-2016

	EPA Proposal			Alternative Scenario 1			Alternative Scenario 2		
Item	2014	2015	2016	2014	2015	2016	2014	2015	2016
(1) Gasoline Use	136.490	138.370	137.580	136.490	140.585	141.991	136.490	140.585	141.991
(2) E10 Blend Wall [(1) X 0.10]	13.649	13.837	13.758	13.649	14.058	14.199	13.649	14.058	14.199
(3) Total Ethanol Use [(5)+(6)+(7)]	13.430	13.360	13.460	13.430	13.833	13.971	13.430	13.833	13.971
(4) Total Ethanol Inclusion Rate [(3)/(1)]	9.84%	9.66%	9.78%	9.84%	9.84%	9.84%	9.84%	9.84%	9.84%
(5) Cellulosic Ethanol Use	0.033	0.106	0.206	0.033	0.106	0.206	0.033	0.106	0.206
(6) Other Advanced Ethanol Use	0.143	0.176	0.200	0.143	0.176	0.200	0.143	0.176	0.200
(7) Conventional Ethanol Use	13.254	13.078	13.054	13.254	13.551	13.565	13.254	13.551	13.565
(8) Conventional Ethanol Mandate	13.250	13.400	14.000	13.250	13.400	14.000	13.250	13.900	14.500
(9) Conventional Mandate Gap [(8)-(7)]	0.000	0.322	0.946	0.000	0.000	0.435	0.000	0.349	0.935

Notes: All values stated in terms of billion gallons except (4), which is in percentage terms. Values for gasoline use and total ethanol use in the EPA proposal are obtained from Table V.B.3-1 of the preliminary document released on May 29, 2015.

Total ethanol use (row (3)) is composed of cellulosic, other advanced, and conventional ethanol, and these projections are reported in rows (5), (6), and (7) of Table 2, respectively. We assume the cellulosic levels are the same as the mandates for cellulosic ethanol each year in the EPA proposal. Other advanced ethanol use represents the sum of imported Brazilian ethanol made from sugar cane and a variety of other domestically produced ethanol that qualifies as an advanced biofuel under the RFS. We use the 2014 total for Brazilian imports and other advanced reported in the EPA proposal. For 2015, we increase the total to the maximum amount needed to fulfill the total advanced mandate above the sum of the biodiesel and cellulosic mandates (2.90 – 1.70 X 1.54 - 0.106 = 0.176 million gallons). For 2016, we arbitrarily increase the total in this category to 200 million gallons. We then imply conventional ethanol use, found in row (7), as the difference between total ethanol use and the sum of cellulosic and other advanced ethanol use. The sub-category "conventional ethanol," for all practical purposes, can be interpreted as corn-based ethanol produced domestically in the U.S. It is often mistakenly assumed that all ethanol consumed in the U.S. is "conventional." This is clearly not the case, with over 400 million gallons from other categories of ethanol projected to be used in the U.S. during 2016. Importantly, the total of over 400 million gallons directly displaces conventional ethanol under a binding E10 blend wall.

We can now move to the central focus of our analysis—comparing conventional ethanol use projections to the conventional (renewable) ethanol mandates proposed by the EPA for 2014-2016. The conventional ethanol mandate in 2014, 13.25 billion gallons, is almost exactly equal to the computed conventional ethanol use. This is obviously not a coincidence, but simply reflects that the EPA used this calculation to determine the 2014 ethanol mandate. In other words, the EPA set the ethanol mandate equal to estimated conventional ethanol use in 2014. The EPA did not follow the same approach for 2015 and 2016, setting the ethanol mandates above projected conventional ethanol use. The gap between the proposed ethanol mandates and conventional ethanol use is reported in the last row of Table 2. We estimate this to total 322 million gallons in 2015 and 946 million gallons in 2016. If one assumes no drawdown in RINs stocks and no change in ethanol inclusion rates, these volumes would have to be met by increasing the use of higher ethanol blends, such as E15 or E85, or increasing the use of non-ethanol biofuels, presumably biodiesel. These two pathways would indeed represent pressure towards the use of higher ethanol blends or other biofuels, consistent with the arguments made by the EPA in the preliminary proposal. For example, if obligated parties under the RFS determined that E85 was the least cost alternative for filling the "conventional gaps," the total gap of 1.268 billion gallons for 2015 and 2016 would require consumption of 1.71 billion gallons of E85 (assuming E85 averages 74 percent ethanol). Alternatively, if obligated parties determined that biodesel was the least cost alternative, the total gap of 1.268 billion gallons for 2015 and 2016 would require additional consumption of 823 billion gallons of biomass-based diesel (1.268/1.54).

The analysis, then, indicates the 2015 and 2016 ethanol mandates in the EPA preliminary proposal do imply some push above the E10 blend wall. However, as noted above, this assumes no change in ethanol inclusion rates, which signify how close actual use of 10 percent ethanol blends is to the theoretical maximum. Comparing entries for row (2) and row (3) for the EPA proposal in Table 2, we can see that the entire conventional gap for 2015 could, in theory, be eliminated by increasing the inclusion rate to 10 percent. Almost 300 million gallons of the 946 million gallon conventional gap in 2016 could be eliminated doing the same thing. It is likely unrealistic to assume that the inclusion rate can ever be pushed all the way to 10 percent, but, higher inclusion rates for 2015 and 2016 would not be unreasonable, particularly given that the 2015 and 2016 rates assumed by the EPA decline relative to 2014. So, from this perspective there is not as much of a push in the proposed conventional mandates as it may first appear.

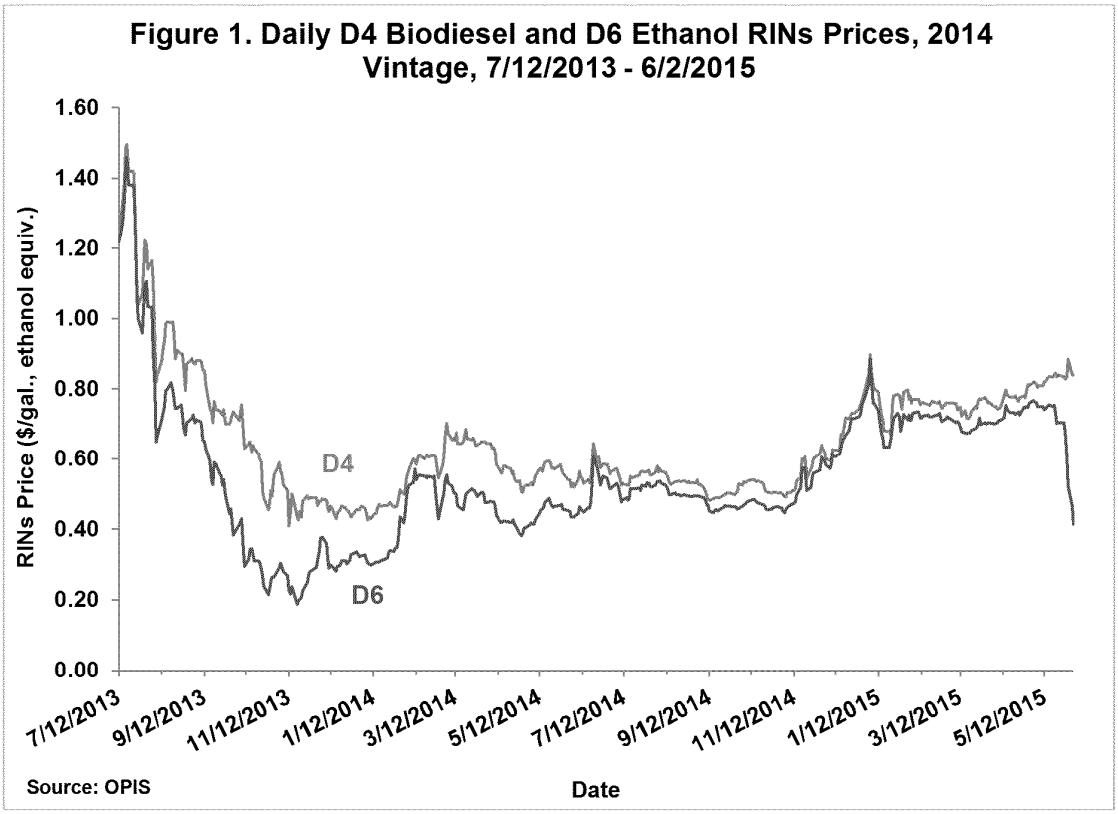
A second critical assumption with respect to the size of the conventional gap is the level of gasoline consumption, which determines the level of the E10 blend wall. As we noted earlier, the EPA projects that gasoline use will increase 1.4 percent in 2015 and then drop by 0.6 percent in 2016. Available data for the first five months of 2015 suggest these assumptions may tun out to be too conservative. For example, the Department of Transportation reported that miles driven in the U.S. was up 4.9 percent in January, 2.8 percent in February, and 3.9 percent in March on a year-over-year basis. An increase in gasoline use of about 3 percent for 2015 would be consistent with a drop in gasoline prices of 30 percent and a short-run gasoline demand elasticity of -0.10. This is one of the assumptions used in projections listed under "Alternative Scenario 1" in Table 2. Other assumptions include a constant ethanol inclusion rate, 9.84 percent, across 2014-2016 and gasoline use increasing 1 percent in 2016 on top of the 3 percent increase assumed for 2015. Under these alternative assumptions the conventional gap is eliminated for 2015 and is more than halved for 2016. Pushing up the ethanol inclusion rate above 9.84 percent would reduce the conventional gap even further in 2016.

Our analysis shows that the EPA's proposed ethanol mandates have very little push beyond the E10 blend wall if gasoline consumption increases at higher rates than assumed by the EPA and the ethanol inclusion rate is only slightly higher. An interesting question, then, is the level of ethanol mandates that would result in a push above the E10 blend wall near the 1.268 billion gallons under the EPA proposal, but with the higher gasoline demand and inclusion rates assumed under the first alternative scenario. These results are shown in Table 2 under the heading "Alternative Scenario 2." The assumptions for this second alternative scenario are identical to the first except the conventional ethanol mandate is set at levels that approximately reproduce the conventional gaps estimated for the EPA proposal. With the higher gasoline use and inclusion rates, ethanol mandates of 13.9 billion gallons in 2015 and 14.5 billion gallons in 2016 result in gaps very close to those under the assumptions of the EPA proposal. This suggests the EPA could potentially increase the 2015 and 2016 ethanol mandates fairly substantially in the final rulemaking based

solely on updated usage projections. This would not require any change to the waiver arguments used by the EPA in the preliminary proposal since the 2014-2016 ethanol mandates would still be less than the (implied) statutory levels.

Market Reaction

As demonstrated by the results in the previous section, one can draw quite different conclusions about the degree of push in the proposed ethanol mandates depending on assumptions about gasoline use and ethanol inclusion rates. Taken at face value, the assumptions used in the preliminary EPA proposal imply substantial pressure for biofuels use above the E10 blend wall, while on the other hand, increasing gasoline use in line with the large drop in gasoline prices and slightly higher ethanol inclusion rates largely eliminates the pressure. It is interesting to consider which way the RINs market voted. More specifically, if expectations of RINs market participants were similar to assumptions in the EPA proposal then the price of D6 ethanol RINs should have remained high both in absolute terms and relative to D4 biodiesel RINs after the EPA proposal was released (see the *farmdoc daily* article on May 28, 2015 for further details). If expectations of RINs market participants were closer to those under first alternative scenario in Table 2, then D6 ethanol prices should have declined sharply after the EPA report was released last Friday. Figure 1 shows the prices of 2014 "vintage" D6 ethanol and D4 biodiesel RINs prices over July 12, 2013 through June 2, 2015. A 2014 vintage RIN indicates the RIN is generated within the 2014 calendar year and can be used for RFS compliance in 2014 and 2015. Using a constant vintage series of RINs prices eliminates jumps in prices that can occur across calendar years due to changing vintages. Also note that any prices reported in 2013 for 2014 vintage RINs are forward contract transactions rather than spot transactions. Figure 1 clearly shows the "cliff diving" seen in the D6 RINs market since last week and this should make it obvious which way the RINs market voted with regard to the degree of push in the EPA proposal. On Tuesday, May 26 the D6 price was $0.705 per gallon and then dropped to $0.415 by Tuesday June 2, a total decline in value of 41 percent (the proposal was obviously leaked in advance of the official release on Friday, May 29). The magnitude of the loss in value of D6 RINs is further highlighted in Figure 2, which shows the ratio of the D6 and D4 prices. This ratio averaged 0.93 for most of the year preceding the release of the EPA proposal, but subsequently plunged to 0.49 on Tuesday, June 2. This is close to the lowest ratio observed since July 2013.



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Does it Matter Whether the EPA Targets Volumetric or Fractional RFS Standards?

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In a *farmdoc daily* article last week (June 3, 2015), we analyzed whether the ethanol mandates recently proposed by the EPA for 2015 and 2016 were high enough to provide a "push" for biofuels use beyond the E10 blend wall. The analysis confirmed that the proposed mandates do indeed imply pressure towards higher ethanol blends or non-ethanol biofuel, but this depends on assumptions about growth in gasoline use and ethanol inclusion rates. Relatively modest increases in the rate of growth in gasoline use and slightly higher ethanol inclusion rates largely eliminated the push above the blend wall. Our analysis assumed that the EPA targeted fixed volumes of ethanol when proposing RFS standards. There is some uncertainty on this point given that the standards are actually enforced in a fractional manner. The purpose of today's article is to examine how estimates of the push above the blend wall implied by the 2015 and 2016 ethanol mandates change depending on whether the EPA targets a fixed volumetric or fixed fractional standard.

Fractional RFS Mandates

We begin with a brief introduction to the process used by the EPA in setting annual RFS standards. While almost all of the attention is focused on the volumetric RFS standards set by the EPA, the annual standards are actually enforced in a fractional, or percentage, fashion. In other words, obligated parties under the RFS must demonstrate that their blending of biofuels as a percentage of total firm production of transportation fuel (petroleum gasoline + petroleum diesel) meets or exceeds the percentage standard established by the EPA. The percentage standard for a given year is simply the mandated national biofuels volume divided by total national use of transportation fuel. This approach allows final mandated volumes to adjust to changes in the total production of transportation fuel after the EPA finalizes standards for a given year. So, if total production of transportation fuel for a given year is under-estimated (over-estimated) then the mandated volume of biofuels will be greater than (less than) the projected level of the mandate. This, of course, assumes that the standards are finalized before a calendar year begins, which has not always been the case in recent years.

It would certainly be logical for the EPA to target fractional standards rather than volume standards given that the mandates are enforced fractionally. However, this was not the case for 2014, the most recent data

point one can use to infer EPA policy in this regard. In the first preliminary proposal for 2014 standards, released in November 2013, the EPA projected total gasoline and diesel use for 2014 at 165.27 billion gallons. The conventional ethanol mandate was set in this proposal at 13.01 billion gallons, which resulted in an (implied) fractional mandate of 7.87 percent (13.01/165.27) for conventional ethanol. In the just-released proposal, the EPA estimated total gasoline and diesel use in 2014 at 17668 billion gallons, a substantial increase from the forecast in the first proposal. The conventional ethanol mandate was increased to 13.25 billion gallons in the latest proposal, but this resulted in the (implied) fractional mandate dropping to 7.5 percent (13.25/176.68). The EPA, in essence, "reset" the volumetric standard to a lower percentage of total transportation fuel use. If the EPA had maintained the fractional mandate from the first proposal, the conventional ethanol mandate for 2014 would have been set in the latest proposal at 13.91 billion gallons (0.0787 X 176.68) instead of 13.25 billion.

Given the wide potential swing in mandated volumes for 2014, it is not surprising that the magnitude of the push above the E10 blend wall also varies substantially. For example, there is no push in the latest conventional ethanol mandate for 2014, 13.25 billion gallons, because this volume is essentially fixed at the level of conventional ethanol use for 2014. In contrast, if the fractional ethanol mandate had been maintained from the earlier proposal at 7.87 percent and the volumetric ethanol mandate was allowed to rise to 13.91 billion gallons with the increase in total transportation fuel use, then the estimated push in 2014 would have been at least 600 million gallons. So, whether the EPA targets fixed volumetric mandates or fixed fractional mandates certainly can have important consequences for the degree of push above the E10 blend wall in the RFS standards. We investigate these consequences for the EPA's proposed 2015 and 2016 conventional ethanol mandates in the next section.

Ethanol Mandate Push

Table 1 contains our analysis of the push contained in the EPA's proposed ethanol mandates under assumptions in the EPA proposal and alternatives with higher gasoline and diesel use for 2015 and 2016. The format of the table is similar to Table 2 in the *farmdoc daily* article last week (June 3, 2015), except we added lines for diesel use (2), total gasoline and diesel use (3), and the (implied) fractional standard for conventional ethanol (12). See our article last week for details regarding assumptions about ethanol inclusion rates and the components of total ethanol use. The gap between the proposed ethanol mandates and conventional ethanol use is reported in row (11) of Table 1. Under the EPA proposal, we estimate the gap to be 322 million gallons in 2015 and 946 million gallons in 2016 (same estimates as in last week's article). If one assumes no drawdown in RINs stocks and no change in ethanol inclusion rates, these volumes would have to be met by increasing the use of higher ethanol blends, such as E15 or E85, or increasing the use of non-ethanol biofuels, presumably biodiesel. For example, if obligated parties under the RFS determined that E85 was the least cost alternative for filling the "conventional gaps," the total gap of 1.268 billion gallons for 2015 and 2016 would require consumption of 1.71 billion gallons of E85 (assuming E85 averages 74 percent ethanol). If obligated parties determined that biodiesel was the least cost alternative, the total gap of 1.268 billion gallons for 2015 and 2016 would require additional consumption of 823 billion gallons of biomass-based diesel (1.268/1.54).

Taken at face value, then, the 2015 and 2016 ethanol mandates in the EPA preliminary proposal imply substantial push above the E10 blend wall. However, as we noted last week, the EPA is projecting gasoline use will only increase 1.4 percent in 2015 and then drop by 0.6 percent in 2016. The EPA is projecting faster growth in diesel use, 2.8 percent in 2015 and 2.4 percent in 2016. Available data for the first part of 2015 suggest these assumptions may turn out to be too conservative. For example, the Department of Transportation reported that miles driven in the U.S. was up 4.9 percent in January, 2.8 percent in February, and 3.9 percent in March on a year-over-year basis. The three alternative scenarios in Table 1 increase gasoline and diesel use 3 percent in 2015 and 1 percent in 2016. The ethanol inclusion rate, cellulosic ethanol use, and other advanced ethanol use are unchanged from the EPA proposal.

In the first alternative scenario ("Fixed Volumetric Standards") in Table 1, the conventional ethanol mandate in 2015 and 2016 is fixed at the same level as in the EPA proposal even though projected gasoline and diesel use increases. The combination of fixed volume standards and rising overall fuel use reduces the fractional ethanol mandates in 2015 and 2016. More consequently, the push in the mandates falls by slightly more than 50 percent, from a total of 1.268 billion gallons for the two years to 0.623 billion gallons.

This happens because rising gasoline use expands the E10 blend wall, which in turn reduces the amount of the conventional mandate gap.

Table 1. U.S. Blend Wall Computations and EPA Proposed Ethanol Mandates, 2014-2016

	EPA Proposal			Alternative Scenario: Fixed Volumetric Standard			Alternative Scenario: Fixed Fractional Standard			Alternative Scenario: Fixed Push		
Item	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
(1) Gasoline Use	136.490	138.370	137.580	136.490	140.585	141.991	136.490	140.585	141.991	136.490	140.585	141.991
(2) Diesel Use	55.210	56.770	58.130	55.210	56.866	57.435	55.210	56.866	57.435	55.210	56.866	57.435
(3) Total Gasoline and Diesel Use	176.680	180.340	180.720	176.680	182.291	183.932	176.680	182.291	183.932	176.680	182.291	183.932
(4) E10 Blend Wall [(1) X 0.10]	13.649	13.837	13.758	13.649	14.058	14.199	13.649	14.058	14.199	13.649	14.058	14.199
(5) Total Ethanol Use [(7)+(8)+(9)]	13.430	13.360	13.460	13.430	13.574	13.892	13.430	13.574	13.892	13.430	13.574	13.892
(6) Total Ethanol Inclusion Rate [(5)/(1)]	9.84%	9.66%	9.78%	9.84%	9.66%	9.78%	9.84%	9.66%	9.78%	9.84%	9.66%	9.78%
(7) Cellulosic Ethanol Use	0.033	0.106	0.206	0.033	0.106	0.206	0.033	0.106	0.206	0.033	0.106	0.206
(8) Other Advanced Ethanol Use	0.143	0.176	0.200	0.143	0.176	0.200	0.143	0.176	0.200	0.143	0.176	0.200
(9) Conventional Ethanol Use	13.254	13.078	13.054	13.254	13.292	13.486	13.254	13.292	13.486	13.254	13.292	13.486
(10) Conventional Ethanol Mandate	13.250	13.400	14.000	13.250	13.400	14.000	13.250	13.545	14.249	13.250	13.615	14.431
(11) Conventional Mandate Gap [(10)-(9)]	0.000	0.322	0.946	0.000	0.108	0.514	0.000	0.253	0.763	0.000	0.323	0.945
(12) Fractional Ethanol Mandate [(10)/(3)]	7.50%	7.43%	7.75%	7.50%	7.35%	7.61%	7.50%	7.43%	7.75%	7.50%	7.47%	7.85%

Notes: All values stated in terms of billion gallons except (6) and (12), which are in percentage terms. Values for gasoline, diesel, and total ethanol use in the EPA proposal are obtained from Table V.B.3-1 of the preliminary document released on May 29, 2015. Gasoline (1) and diesel (2) use are slightly greater than total gasoline and diesel use (3) in 2014 due to small refinery exemptions. These values are set to zero for 2015 and 2016 in the calculations presented in the preliminary document.

In the second alternative scenario ("Fixed Fractional Standards") in Table 1, the conventional ethanol mandate volumes in 2015 and 2016 increase as projected gasoline and diesel use increase. The mandates have to increase by 145 and 249 million gallons in 2015 and 2016, respectively, to keep the mandates in fractional terms the same as under the EPA proposal. The push in the mandates is reduced compared to the EPA proposal but still totals 1.016 billion gallons for the two years. The magnitude of the push declines relative to the EPA proposal because, under the assumptions of the analysis, part of the increase in the volume of the ethanol mandates in 2015 and 2016 is offset by increased conventional ethanol use.

The third alternative scenario ("Fixed Push") in Table 1 assumes that the EPA targets neither a fixed volumetric or fixed fractional standard, but instead targets the magnitude of the push in conventional ethanol mandates. This is accomplished by setting the fractional standards at a level that maintains the same push as we estimated for the recent EPA proposal. Maintaining the push as gasoline and diesel use increases requires slightly higher fractional ethanol standards—7.47 vs. 7.43 percent for 2015 and 7.85 vs. 7.75 percent for 2016. The higher fractional standards increase the ethanol volume standards by an amount equal to the increase in conventional ethanol use, thus, keeping the magnitude of the push the same as in the EPA proposal. The conventional ethanol volume mandates under this scenario are 13.615 billion gallons in 2015 and 14.431 billion gallons in 2016.

Implications

When setting RFS mandates for conventional ethanol, the EPA can target fixed volumetric standards, fixed fractional standards, or a fixed "push" in the standards. Push in this context is the pressure in the conventional ethanol standards for biofuels use above the E10 blend wall. Which approach the EPA actually uses is an important question given the likelihood that gasoline and diesel use is growing faster than the EPA assumed in their recent proposal for the 2014, 2015, and 2016 RFS standards. If the EPA targets fixed volumetric standards, and therefore does not change the conventional ethanol mandates as total fuel usage increases, we estimate that the magnitude of the push in the ethanol mandates will decline sharply. If the EPA targets fixed fractional (percentage) standards, and therefore raises the conventional

ethanol mandates as total fuel usage increases, we estimate that the magnitude of the push in the ethanol mandates only declines marginally. The EPA could also target a fixed push in the standards by increasing fractional standards enough to offset any increases in ethanol use as total fuel use increases. We estimate that the degree of push in the conventional ethanol standards under the recent EPA proposal is 1.268 billion across 2015 and 2016. This is the magnitude of the push that would need to be maintained if the EPA targets a fixed push in the ethanol standards

Our analysis highlights the sensitivity of estimates of the push in conventional ethanol mandates to the policy target of EPA. It does indeed matter whether the EPA targets fixed volumetric standards, fixed fractional standards, or a fixed push in the standards. The most recent data point one can use to infer EPA intentions in this regard is 2014. Compared to the first preliminary proposal released in November 2013, the EPA, in essence, "reset" the volume for the 2014 conventional ethanol mandate to a lower percentage of total transportation fuel use in the latest proposal released on May 29, 2015. This behavior suggests the EPA leans towards a fixed volumetric standard; however, one should use considerable caution before reaching this conclusion since the May 2015 proposal was released well after calendar year 2014. The language in the most recent proposal suggests the EPA currently leans more towards a fixed fractional standard, or even a fixed push in the standard, *"The standards we are proposing for 2015 and 2016 in particular would drive growth in renewable fuels by providing appropriate incentives to overcome current constraints and challenges to further the goals of Congress in establishing the RFS program." (p.7)* Given the collapse in D6 RINs prices since the release of the EPA proposal (*farmdoc daily*, June 3, 2015), RINs market participants appear to believe that the EPA is targeting a fixed volumetric standard and the degree of push in the conventional ethanol mandates will largely disappear if, as expected, gasoline and diesel use increases more rapidly. If these expectations are incorrect the RINs market could be setup for a major surprise when the EPA finalizes the standards for 2014-2016. The bottom-line is that the EPA needs to much more clearly communicate the target it is currently using in setting the RFS standards. Much may hang in the balance for biofuels producers, feedstock suppliers, obligated parties under the RFS, and RINs market traders.

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farmdoc DAILY

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EPA Doubles Down on Questionable Reading of the RFS Statute

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In November 2013, EPA proposed volume requirements under the Renewable Fuel Standard (RFS) for the 2014 calendar year. In December 2014, it announced that it would not be finalizing the standards for 2014 during that calendar year. In April 2015 it provided a timeline for proposed standards by June 1, 2015. On Friday, May 29, 2015, EPA released a proposed rule to set the volume requirements for the 2014, 2015 and 2016 years. Previous articles (*farmdoc daily*, November 6, 2013; January 16, 2014) evaluated EPA's authority to waive the RFS requirements and the new proposed rule returns to that issue. This article further evaluates EPA's waiver arguments.

Background

Briefly, Congress passed an ambitious goal for increasing the production of renewable fuels in the Energy Independence and Security Act of 2007, known as the Renewable Fuels Standard (RFS). The 2007 version, however, was the second RFS; the initial mandate was included in the Energy Policy Act of 2005 Included within the original RFS statute and unchanged by the 2007 bill is waiver authority allowing EPA to adjust the statutory requirements if there will be severe economic or environmental harm, or there is "an inadequate domestic supply" of the renewable fuels (42 U.S.C. §7545(o)(7)(A)(ii)) (see *farmdoc daily* November 6, 2013 and June 3, 2015 for additional background).

Discussion

As previously discussed, EPA is Constitutionally-bound to follow the statute and the clear intent of Congress; where there is ambiguity about what Congress intended, EPA is permitted a reasonable and permissible interpretation of its authority to which a court must give deference. Legal precedent on these issues was discussed in the previous articles and will not be revisited in detail. The focus in this article, however, will center around basic principles of statutory interpretation (See e.g., Whitman v. American Trucking Assn., Inc., 531 U.S. 457 (2001)) to evaluate EPA's arguments in light of the provisions in the Clean Air Act.

In short, EPA's position is: "we believe that limitations in the production or importation of qualifying renewable fuels, and factors that limit supplying those fuels to the vehicles that can consume them, both

constitute circumstances that warrant a waiver." EPA acknowledges that it is making the same determination of the waiver authority as in the November 2013 rule, and that it continues to look to the "decrease in total gasoline consumption in recent years which resulted in a corresponding and proportional decrease in the maximum amount of ethanol that can be consumed" as E10 and the limited amount of E15 and E85. (EPA, pp.24-25). The phrase "inadequate domestic supply" remains at the heart of the issue. EPA interprets that phrase to include both the "limitations in production or importation of qualifying renewable fuels" as well as "factors that limit supplying those fuels to the vehicles that can consume them". (EPA, pp.28-29). A significant underlying question raised by EPA's interpretation is whether the RFS applies only to fuel blenders and refiners required to purchase renewable fuels under the mandate or includes the "ultimate consumers."

EPA's reading of the statute relies on the supply of fuels to the consumer as the justification to allow considerations regarding fuel infrastructure and other constraints into the waiver determination. EPA's argument states that "[a]dequacy of supply would logically be understood in terms of the parties who use the supply of renewable fuel" and "involve consideration of factors different from those involved when considering adequacy of supply to the obligated parties." EPA concludes that this concept of supply should "encompass the full range of constraints that could result in an inadequate supply of renewable fuel to the ultimate consumers, including fuel infrastructure and other constraints" such as "factors affecting the ability to distribute, blend, dispense, and consume those renewable fuels in vehicles." That conclusion leads to "interpreting this waiver provision as authorizing EPA to consider the adequacy of supply of renewable fuel to all of the relevant parties, including the adequacy of supply to the ultimate consumer." (EPA, pp.28-29).

The statute states that "regulations promulgated" for renewable fuels, as well as the obligation itself, are "applicable to refineries, blenders, distributors, and importers, as appropriate." While these directives contain no mention of consumers, they clarify that the regulations shall not "restrict geographic areas in which renewable fuel may be used" nor "impose any per-gallon obligation for use of the renewable fuel." (42 U.S.C. §7545(o)(2)(A)). The explicit wording here appears to indicate that Congress was limiting application of the statute to blenders and refiners, and that the use of the blended fuel was not to be a consideration.

The RFS is a technology-forcing mandate on the renewable fuel producers, as well as the oil refining and blending industries: Congress intended "the RFS program to compel the industry to make dramatic changes in a relatively short period of time." (EPA, p.41). The significance is clear in a comparison with other provisions of the Clean Air Act pertaining to transportation fuels. The different components of these regulatory provisions undermines EPA's waiver authority argument. Table 1 provides a comparison of the waiver provisions that EPA discusses in the proposed rule along with the provisions applying the regulation or instructing EPA to promulgate regulations.

Notably, each of the other provisions clearly apply to the ultimate consumer in some form or fashion, which arguably necessitates the different treatments in the respective waiver provisions with respect to consideration of the ultimate consumer. The RFS excludes considerations about the use of renewable fuels by vehicles or the ultimate consumer; it applies only to refiners, blenders and importers. Excluding the ultimate consumer from the regulations would explain why the waiver does not include a comparable consumer-focused provision. Given the different wording choices in each of the provisions, Congress was clearly capable of distinguishing (and did distinguish) among the different elements of supply for transportation fuel. It is also clear that Congress knew how to include impacts on the consumer in a waiver provision. From the standpoint of interpreting the statute, it is instructive that only the RFS waiver lacks any connection to the ultimate consumer. This works against EPA's attempt to use the ultimate consumer now as a consideration upon which to base its use of the waiver authority.

Table 1. Clean Air Act (42 U.S.C. §7545) Provision Comparison			
(m) Oxygenated fuels	*(o) Renewable fuel program*	*(k) Reformulated gasoline*	*(c) Offending fuels and fuel additives*
Waiver Provisions			
"there is an inadequate domestic supply of, or distribution capacity for, oxygenated gasoline"	"there is an inadequate domestic supply"	"insufficient capacity to produce" (nonattainment states); or "insufficient capacity to supply" (other states)	"extreme and unusual fuel or fuel additive supply circumstances . . . which prevent the distribution of an adequate supply of the fuel or fuel additive to consumers"
Application or Regulation			
"any gasoline sold, or dispensed, **to the ultimate consumer**."	"applicable to refineries, blenders, distributors, and importers, as appropriate."	"promulgate regulations . . . for reformulated gasoline **to be used in gasoline-fueled vehicles** in specific nonattainment areas" Prohibiting the "sale or dispensing by any person of conventional gasoline **to ultimate consumers** in any covered area."	"control or prohibit the manufacture, introduction into commerce, offering for sale, or sale of any fuel or fuel additive **for use in a motor vehicle** . . ."

The legislative history for the RFS adds further perspective. The original version of the RFS as reported from the Committee and introduced in the House on April 18, 2005, contained the following waiver language: "that there is an inadequate domestic supply or distribution capacity to meet the requirement." (H.R. 6 §1501(a)(8)(A)(ii)). The provision remained unchanged in the version that passed the House. The version of the bill that passed the Senate, however, contains modified waiver language that does not include that phrase and reads: "that there is an inadequate domestic supply." (H.R. 6 (Engrossed Amendment Senate) §211(a)(2)). The original Senate amendment that served as a substitute to the House language contains similar waiver language (§204(h)), stating "that there is an inadequate domestic supply to meet the requirement." (Senate Amendment SA775, by Senator Domenici, June 14, 2005; agreed to by unanimous consent). The legislative history therefore indicates that either the Senate intentionally removed the phrase "or distribution capacity" or that the two chambers disagreed on the issue. Either way, the final conference agreement between the two and the resulting legislation signed into law indicates that the final statement by Congress on the waiver authority did not include the "distribution capacity" phrase. This also lends support to the argument made by the ethanol industry that Congress intentionally removed the phrase so that it would not be a consideration in the waiver decision (reported here).

Finally, reading the statute in this way would also seem to align with reality about the renewable fuel mandate. The RFS is designed only for the refiners and blenders of ethanol, not the consumer of transportation fuel. The ultimate consumer is not an obligated party under the mandate; they do not purchase ethanol directly from the ethanol producer nor are they required to purchase Renewable Identification Numbers to prove compliance. In short, the mandate is not on the consumer. While EPA claims that the "waiver provision does not specify what product is at issue" in the RFS, that seems specious given the statutory wording and a comparison with other provisions in the same section. The RFS applies to renewable fuel supplied to the blenders and refiners, it contains no comparable provision applying it to the ultimate consumer. EPA fails to explain how a statute designed to put a mandate on refineries and

blenders to compel them to make "dramatic changes" can also include a waiver provision to relieve them of the obligation if they do not get the product to consumers.

The very design of the statute, as EPA acknowledges, is as a mechanism to push industry. Taking into consideration that industry's blended supply to the ultimate consumer as justification for waiving aspects of the RFS would appear to be in direct conflict with Congressional intent. Consider, for example, the discordance inherent in various components of EPA's argument. First, it looks to the use of "factors [that] operate as practical and legal limits to how much renewable fuel can be distributed to and used by consumers" (EPA, p.34), yet acknowledges that "the renewable fuel volume targets" were developed with "the understanding that the growth. . . would be beyond any previously demonstrated ability of the industry to produce, distribute, and consume renewable fuels." (EPA, p.41) And while "[i]t is apparent, therefore, that Congress intended to require changes that would be unlikely to occur absent the new program" (EPA, p.41), EPA is using the waiver provisions even though "obligated parties have had years to plan for the E10 blendwall and that there clearly are steps that obligated parties could take to increase investments needed to increase renewable fuel use above current levels." (EPA, p.34). If forcing the development of solutions to these entirely foreseeable challenges was the very point of the RFS, using the failure to do so as justification for reducing the statutory requirements would seem to eviscerate the statute and Congressional intent, rewarding the failure with a release from the obligations.

Conclusion

It is very difficult to square the statute's words with EPA's reading of them, which is pointedly highlighted by one of EPA's comments: "biofuel producers could also have taken appropriate measures . . . nothing precludes biofuel producers from independently marketing E85 or increasing the production of non-ethanol renewable fuels." (EPA, p.34). The RFS was designed to push the renewable fuel industry to supply, and the blending/refining industry to purchase, renewable fuels. EPA admits that "there is no shortage of ethanol" but it feels that "[l]egal requirements limit[ing] ethanol content of most gasoline to 10%" and "marketplace and infrastructure constraints" are sufficient to justify the agency's revision of the Congressional mandate. Under this proposed rule, EPA appears to be turning the statute upside down, switching it from one that was meant to force industry action to one that permits industry inaction to override the statute.

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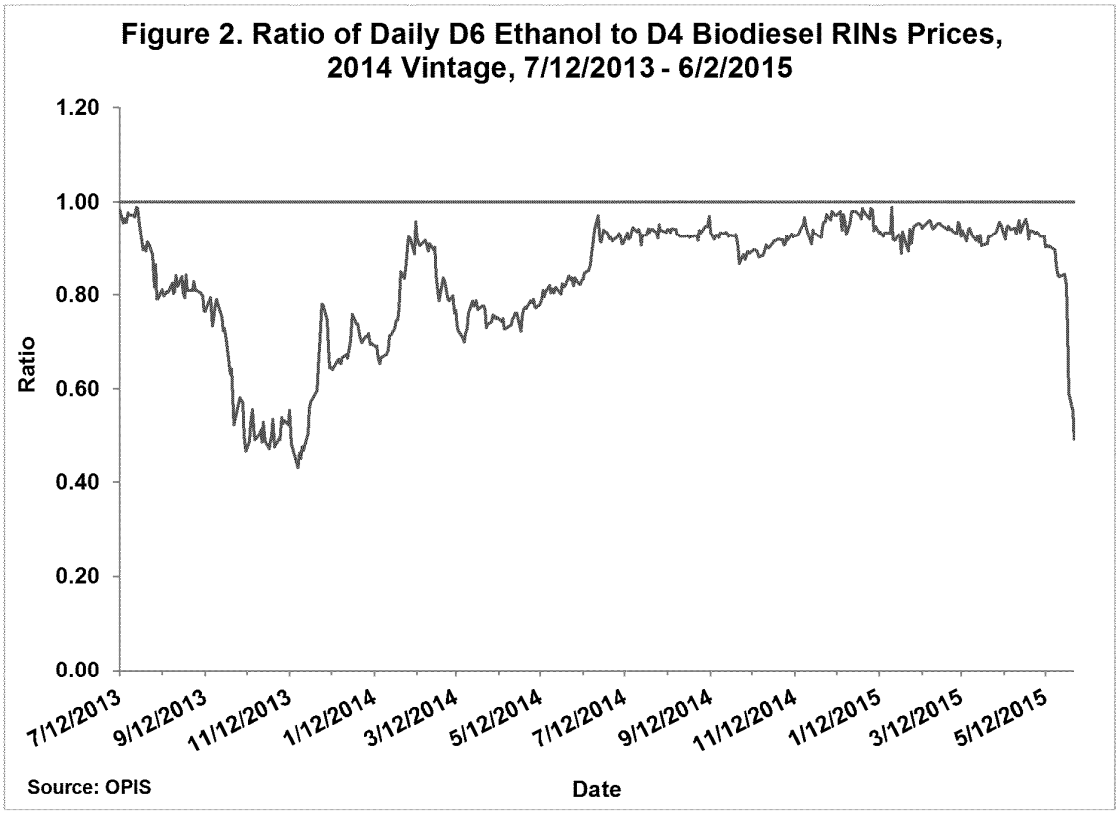

Implications

The long-awaited EPA proposal for 2014, 2015 and 2016 RFS mandates was released last week. The proposal largely confirmed expectations for large increases in biomass-based diesel but ethanol mandates were smaller than many expected. Despite the substantial cuts to the ethanol mandates, the EPA maintains that the mandates are high enough to provide a "push" to biofuels use beyond the E10 blend wall. Our analysis confirms that the ethanol mandates proposed by the EPA for 2015 and 2016 do imply some degree of pressure for biofuel volumes above the E10 blend wall, but this depends crucially on assumptions about growth in gasoline use and ethanol inclusion rates. Relatively modest increases in the rate of growth in gasoline use and slightly higher ethanol inclusion rates largely eliminate the push above the blend wall. The huge decline in D6 ethanol RINs prices in the last week suggests the market believes the EPAs assumptions are too conservative and the proposed ethanol mandates provide little pressure for breaching the blend wall. Assuming higher gasoline use and inclusion rates, we estimate that ethanol mandates of 13.9 billion gallons in 2015 and 14.5 billion gallons in 2016 would restore the pressures to increase biofuel use beyond the E10 blend wall that the EPA apparently intended in its proposal.

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Implementing the RFS with a "Push" Strategy: What Happens after 2016?

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The EPA released their long-awaited preliminary proposal for 2014-2016 RFS standards late last month. In our first *farmdoc daily* article (June 3, 2015) after the release of the proposal, we analyzed whether the renewable (ethanol) mandates proposed by the EPA, while lower than statutory levels, were still high enough to provide a "push" for biofuels use beyond the E10 blend wall. The analysis confirmed that the mandates do indeed imply pressure towards higher ethanol blends or non-ethanol biofuel, but this depends on assumptions about growth in gasoline use and ethanol inclusion rates. In our second *farmdoc daily* article (June 10, 2015) after the release, we investigated how the degree of push above the blend wall changes depending on whether the EPA targets a fixed volumetric or fixed fractional standard. The analysis in these articles highlights an important change in direction for EPA policy with respect to setting annual RFS standards. Compared to the preliminary proposal for 2014 released on November 30, 2013, the latest proposal indicates the EPA is serious about pushing RFS standards past the E10 blend wall. The purpose of today's article is to examine the implications of the EPA continuing this policy direction after 2016.

Analysis

The analysis in our previous two articles (*farmdoc daily*, June 3, 2015; June 10, 2015) focused on 2014-2016, as these are the years covered by the EPA's recent RFS rulemaking. Here, we assume that over time, the EPA will expand the magnitude of the push implied in the most recent proposal, consistent with language in the proposal. For example:

> *"The proposed volume requirements would push the fuels sector to produce and blend more renewable fuels in 2015 and 2016 in a manner that is consistent with the goals Congress envisioned. The proposed volumes are less than the statutory targets for 2015 and 2016 but higher than what the market would produce and use in the absence of such market-driving standards. The 2015 and 2016 standards are expected to spur further progress in overcoming current constraints and lead to continued growth in the production and use of higher ethanol blends and other qualifying renewable fuels. In this regard the proposed standards are intended to fulfill the spirit and*

intent of Congress and provide guidance to market participants. Once finalized, this rule would put renewable fuel production and use on a path of steady, ambitious growth." (p. 33102)

Our focus is on calculating the magnitude of the annual renewable, advanced, and total RFS gaps through 2022 that would be created by implementation of the RFS along this policy trajectory. We conducted a similar analysis in a *farmdoc daily* article on February 19, 2015, but under the assumption that the renewable mandate is implemented at statutory levels for all years over 2014-2022. The RFS statutory mandates for total, advanced, and renewable (ethanol) fuels each year from 2014 through 2022 can be found in Table 1.

For 2014, 2015, and 2016, the analysis is based on the assumptions that (1) the RFS is implemented as proposed and (2) the estimates and projections relative to gasoline consumption and consumption of advanced ethanol included in that proposal are correct. The analysis for subsequent years is based on the assumptions that (1) the cellulosic, and therefore total advanced biofuel mandates will continue to be written down, (2) the mandate for biodiesel will continue to increase each year through 2022, (3) domestic gasoline and diesel consumption in 2017-2022 stabilizes at the projected level for 2016, and (4) the domestic ethanol inclusion rate remains stable from 2017 through 2022. We also make the simplifying assumption that the level of RINs stocks and biofuels stocks remain constant.

In order to implement the RFS standards over 2017-2022 with an increasing push above the E10 blend wall, estimates of the blend wall for these years must be made. We do this in Table 2 based on estimates of domestic gasoline consumption and the inclusion rate of ethanol. Note that estimates for 2014, 2015, and 2016 are drawn directly from the EPA's proposal. For 2017-2022, we assume domestic gasoline consumption stabilizes slightly above the projection for 2016 and the ethanol inclusion rate stabilizes near the average rate estimated by EPA for 2014-2016. Estimated ethanol consumption declines 70 million gallons in 2015, increases 100 million gallons in 2016, increases 64 million gallons in 2017, and remains at the 2017 level through 2022. Those estimates are obviously very sensitive to the assumptions about the magnitude of domestic gasoline consumption and the rate of increase in consumption of higher ethanol blends (E15 and E85). The assumed constant inclusion rate implies no growth in the consumption of higher ethanol blends. However, the potential for this growth will be evident in estimated RFS gaps shown later.

Table 3 summarizes the assumptions about the implementation of the RFS each year through 2022. Implementation for 2014-2016 is based on the EPA's proposed mandates. For subsequent years, it is assumed that the cellulosic mandate continues to be written down to small, but increasing, levels and that the total advanced biofuels mandate is written down by an equal amount. It is assumed that the biodiesel mandate is increased by 100 million gallons each year and the renewable mandate is increased by 200 million gallons each year until the statutory level of 15 billion gallons is reached in 2021. These assumptions are obviously arbitrary to some degree, but reflect our expectation of continued slow growth in cellulosic ethanol production and the expectation for EPA rulemaking to provide a meaningful push for increased biofuels consumption.

The magnitude of the expected annual write down from statutory requirements, by category of fuel, is summarized in Table 4. The write down is the difference between the value in each cell in Tables 1 and 3. No write down in biodiesel mandates is required since implementation is expected to require volumes in excess of statutory values of at least one billion gallons per year. The write down in the renewable mandate declines by 200 million gallons per year and is at zero for 2021 and 2022. The write down in the cellulosic and total advanced mandates become very large over time.

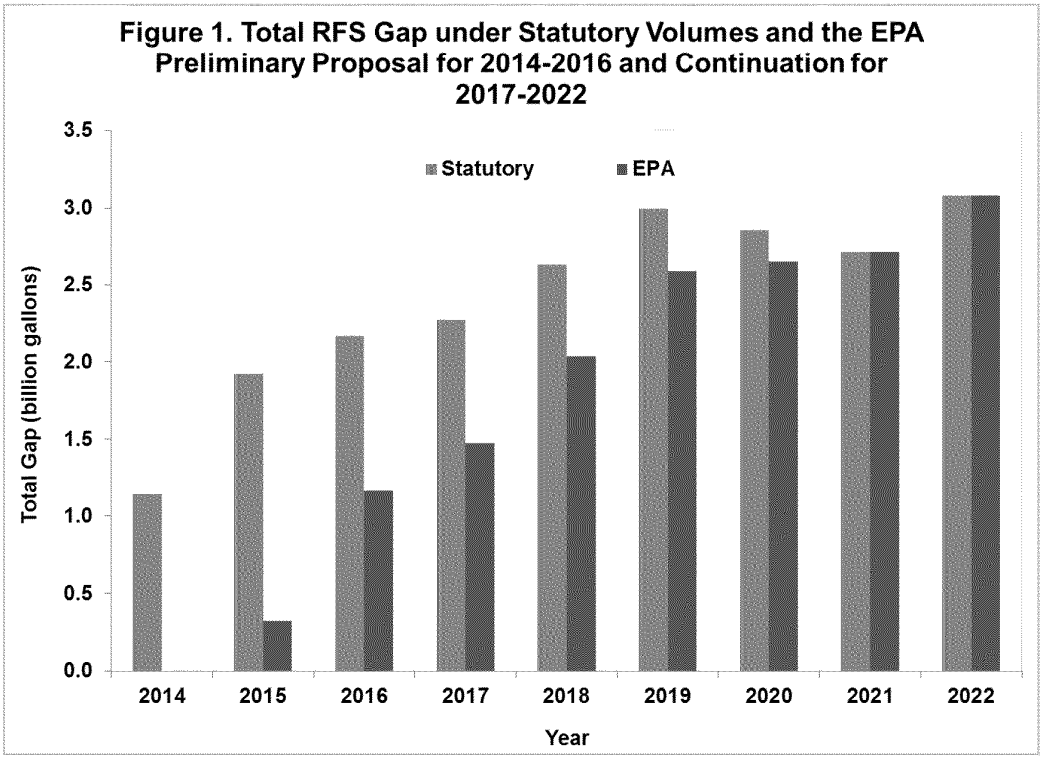
In Table 5, we calculate the magnitude of the advanced biofuel gap implied by the assumptions concerning rulemaking for the RFS, including the magnitude of the annual mandate for total biofuels and the magnitude of the biodiesel mandate. In addition, the size of the gaps reflects the expected consumption of imported Brazilian ethanol and consumption of undifferentiated domestic ethanol. The gap is the difference between the mandate for total advanced biofuel and the sum of the biodiesel mandate, cellulosic ethand consumption, Brazilian ethanol consumption, and undifferentiated domestic ethanol consumption. For 2014-2016, the calculated size of the advanced biofuels gap is based on the current EPA proposed rulemaking and the estimates of Brazilian and undifferentiated ethanol consumption contained in the EPA analysis. For 2017-2022, the calculated size of the gap is based on our previous assumption about the size of the total advanced and biodiesel mandates (except for 2017 which reflects the EPA proposal), cellulosic ethanol consumption, and the assumption that consumption of both Brazilian and undifferentiated ethanol

stabilize at 100 million gallons each. The calculation reflects that each gallon of biodiesel receives 1.54 credits towards the RFS (weighted average D4 RINs generation for 2014). The gap must be filled by consumption of one or more advanced biofuels that exceeds the mandated or assumed quantities in this analysis. The calculated gap is zero in 2014 and 2015 and grows to 1.104 billion gallons in 2022.

In Table 6 we calculate the size of the renewable (ethanol) gap implied by the assumed mandate and estimated magnitude of conventional ethanol consumption. The estimate of conventional ethanol consumption each year is the difference between the estimate of total ethanol consumption presented in the last column of Table 2 and the consumption of advanced ethanol (the sum of the estimates for cellulosic, Brazilian, and undifferentiated domestic ethanol) presented in Table 5. The renewable gap is zero in 2014 since the RFS mandate was set to reflect actual consumption. The gap grows over time as the mandate increases, total ethanol consumption stabilizes, and consumption of advanced ethanol increases. The gap nears two billion gallons in 2022.

The sum of the estimates of the renewable gap and the advanced gap results in a total RFS gap of nearly 3.1 billion gallons by 2022. The size of the gap reflects the degree of push implied by the magnitude of the mandates used in this analysis. Over the nine years from 2014-2022, the estimated conventional ethanol gap totals 10.899 billion gallons, the advanced gap totals 5.156 billion gallons, and the total RFS gap totals 16.055 gallons.

Finally, it is interesting to consider the size of the total RFS gap for 2014-2022 under the trajectory assumed here versus that under statutory volumes. We computed the total gap for statutory volumes by assuming the renewable mandate was 14.4 billion gallons in 2014 and 15 billion gallons thereafter. All other assumptions are exactly the same as in Tables 2-6. Figure 1 presents the estimated total RFS gaps under the two scenarios. Given the write down of the renewable mandate for 2014-2016 under the EPA proposal it is not surprising that there are large differences in the total gap for these years. Specifically, the estimated total gap is 3.75 billion gallons smaller for 2014-2016 under the EPA proposal compared to implementation at the statutory renewable mandate levels. However, after 2016 the difference in the total gap narrows fairly quickly and disappears entirely by 2021. The differences total only 2 billion gallons over 2017-2022. This, of course, assumes that the EPA would be willing to increase the push in the RFS standards along the lines assumed here.



Implications

The EPA signaled an important change in direction for setting annual RFS standards in its recent preliminary proposal for 2014-2016. The proposal indicates the EPA is serious about pushing RFS standards past the E10 blend wall. We examined the implications of the EPA continuing this policy direction after 2016 and found that the size of the total gap in the RFS mandates, or the "push," grows surprisingly quickly. For example, the total gap exceeds 2 billion gallons by 2018 and grows to 3 billion gallons in 2022. If the EPA were to follow this push strategy for the RFS through 2022, the next interesting question is how the gaps would be filled. The renewable (ethanol) component of the gap could be filled by a combination of larger quantities of higher ethanol blends and/or larger quantities of biodiesel. The advanced component of the gap could be filled by a combination of larger imports of Brazilian ethanol and larger quantities of biodiesel. Larger imports of Brazilian ethanol could be problematic, however, under the constraints of a blend wall. Each additional gallon of imported ethanol would replace a gallon of conventional ethanol which in turn would widen the renewable gap. That larger gap would have to be filled with additional quantities of higher ethanol blends or additional quantities of biodiesel. The end result would likely be larger quantities of biodiesel. There are a number of issues that will impact the growth path of biodiesel consumption even with an aggressive RFS. These include the fate of the biodiesel tax credit, the economics of blending Brazilian ethanol, and the rate of growth in consumption of non-conventional ethanol and higher blends of ethanol. We will examine some of these issues in future articles.

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Table 1. U.S. Renewable Fuels Standard for 2014-2022--Billion Gallons

Calendar		Advanced				
Year	Total	Cellulosic	Biodiesel(a)	Undifferentiated	Total	Renewable
2014	18.150	1.750	*	2.000	3.750	14.400
2015	20.500	3.000	*	2.500	5.500	15.000
2016	22.250	4.250	*	3.000	7.250	15.000
2017	24.000	5.500	*	3.500	9.000	15.000
2018	26.000	7.000	*	4.000	11.000	15.000
2019	28.000	8.500	*	4.500	13.000	15.000
2020	30.000	10.500	*	4.500	15.000	15.000
2021	33.000	13.500	*	4.500	18.000	15.000
2022	36.000	16.000	*	5.000	21.000	15.000

(a) each gallon of biomass-based biodiesel is assumed to receive 1.54 gallons credit towards RFS

* minimum of 1.0 billion gallons

Table 2. Gasoline and Diesel Use, E10 Blend Wall, and Total Ethanol Use under EPA Preliminary Proposal for 2014-2016 and Continuation for 2017-2022--Billion Gallons

Calendar Year	Gasoline Use(a)	Diesel Use(a)	Total Gasoline and Diesel Use(a)	E10 Blend Wall	Total Ethanol Inclusion Rate	Total Ethanol Use(b)
2014	136.490	55.210	191.700	13.649	9.84%	13.430
2015	138.370	56.770	195.140	13.837	9.66%	13.360
2016	137.580	58.130	195.710	13.758	9.78%	13.460
2017	138.000	58.500	196.500	13.800	9.80%	13.524
2018	138.000	58.500	196.500	13.800	9.80%	13.524
2019	138.000	58.500	196.500	13.800	9.80%	13.524
2020	138.000	58.500	196.500	13.800	9.80%	13.524
2021	138.000	58.500	196.500	13.800	9.80%	13.524
2022	138.000	58.500	196.500	13.800	9.80%	13.524

(a) petroleum and renewable

(b) domestic only

Table 3. Implementation of U.S. Renewable Fuels Standard under EPA Preliminary Proposal for 2014-2016 and Continuation for 2017-2022--Billion Gallons

Calendar		Advanced				
Year	Total	Cellulosic	Biodiesel(a)(b)	Undifferentiated	Total	Renewable
2014	15.930	0.033	1.630	0.137	2.680	13.250
2015	16.300	0.106	1.700	0.176	2.900	13.400
2016	17.400	0.206	1.800	0.422	3.400	14.000
2017	17.925	0.225	1.900	0.574	3.725	14.200
2018	18.640	0.240	2.000	0.920	4.240	14.400
2019	19.355	0.255	2.100	1.266	4.755	14.600
2020	19.570	0.270	2.200	1.112	4.770	14.800
2021	19.785	0.285	2.300	0.958	4.785	15.000
2022	20.300	0.300	2.400	1.304	5.300	15.000

(a) each gallon of biomass-based biodiesel is assumed to receive 1.54 gallons credit towards RFS

(b) EPA preliminary proposal also included biomass-based diesel volume for 2017

Table 4. Write Down of U.S. Renewable Fuels Standard under EPA Preliminary Proposal for 2014-2016 and Continuation for 2017-2022--Billion Gallons

Calendar		Advanced				
Year	Total	Cellulosic	Biodiesel	Undifferentiated	Total	Renewable
2014	2.220	1.717	0.000	1.863	1.070	1.150
2015	4.200	2.894	0.000	2.324	2.600	1.600
2016	4.850	4.044	0.000	2.578	3.850	1.000
2017	6.075	5.275	0.000	2.926	5.275	0.800
2018	7.360	6.760	0.000	3.080	6.760	0.600
2019	8.645	8.245	0.000	3.234	8.245	0.400
2020	10.430	10.230	0.000	3.388	10.230	0.200
2021	13.215	13.215	0.000	3.542	13.215	0.000
2022	15.700	15.700	0.000	3.696	15.700	0.000

Table 5. Advanced RFS under EPA Preliminary Proposal for 2014-2016 and Continuation for 2017-2022--Billion Gallons

Calendar				Undifferentiated	Undifferentiated	Advanced
Year	Total	Cellulosic	Biodiesel(a)(b)	Brazilian Ethanol	Domestic Ethanol	Mandate Gap
2014	2.680	0.033	1.630	0.064	0.079	0.000
2015	2.900	0.106	1.700	0.076	0.100	0.000
2016	3.400	0.206	1.800	0.100	0.100	0.222
2017	3.725	0.225	1.900	0.100	0.100	0.374
2018	4.240	0.240	2.000	0.100	0.100	0.720
2019	4.755	0.255	2.100	0.100	0.100	1.066
2020	4.770	0.270	2.200	0.100	0.100	0.912
2021	4.785	0.285	2.300	0.100	0.100	0.758
2022	5.300	0.300	2.400	0.100	0.100	1.104

(a) each gallon of biomass-based biodiesel is assumed to receive 1.54 gallons credit towards RFS

(b) EPA preliminary proposal also included biomass-based diesel volume for 2017

Table 6. Conventional, Advanced, and Total RFS Gaps under EPA Preliminary Proposal for 2014-2016 and Continuation for 2017-2022--Billion Gallons

Calendar	Renewable	Conventional	Renewable	Advanced	Total RFS
Year	Mandate	Ethanol Use	Gap	Gap	Gap
2014	13.250	13.254	0.000	0.000	0.000
2015	13.400	13.078	0.322	0.000	0.322
2016	14.000	13.054	0.946	0.222	1.168
2017	14.200	13.099	1.101	0.374	1.475
2018	14.400	13.084	1.316	0.720	2.036
2019	14.600	13.069	1.531	1.066	2.597
2020	14.800	13.054	1.746	0.912	2.658
2021	15.000	13.039	1.961	0.758	2.719
2022	15.000	13.024	1.976	1.104	3.080

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Congress of the United States

House of Representatives

COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM

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December 22, 2014

Ms. Janet G. McCabe
Acting Assistant Administrator for Air and Radiation
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20460

Dear Ms. McCabe:

Thank you for appearing before the Committee on Oversight and Government Reform's Subcommittee on Energy Policy, Health Care and Entitlements on December 10, 2014, at the hearing entitled, "Examining EPA's Management of the Renewable Fuel Standard Program." We appreciate the time and effort you gave as a witness before the Committee.

Pursuant to the direction of the Chairman, the hearing record remains open to permit Members to submit additional questions to the witnesses. Attached are questions directed to you. In preparing your answers to these questions, please address your response to the Member who has submitted the question and include the text of the Member's question along with your response.

Please provide your response to these questions by Monday, January 5, 2014. Your response should be addressed to the Committee office at 2157 Rayburn House Office Building, Washington, DC 20515. Please also send an electronic version of your response by e-mail to Sarah Vance, Assistant Clerk, at Sarah.Vance@mail.house.gov in a single Word formatted document.

Thank you for your prompt attention to this request. If you need additional information or have other questions, please contact Sarah Vance at (202) 225-5074.

Sincerely,

James Lankford
Chairman
Subcommittee on Energy Policy, Health Care and Entitlements

Enclosure

cc: The Honorable Jackie Speier, Ranking Minority Member
Subcommittee on Energy Policy, Health Care and Entitlements

Questions for Ms. McCabe
Acting Assistant Administrator for Air and Radiation
U.S. Environmental Protection Agency

Questions from Chairman Lankford
Subcommittee on Energy Policy, Health Care and Entitlements
Committee on Oversight and Government Reform

Hearing on:
"Examining EPA's Management of the Renewable Fuel Standard Program"

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1. Does EPA plan to retain the methodology it proposed for the 2014 RFS calculations for 2015 and beyond? If not, what methodology will EPA use? Will it still recognize the blend wall?

2. Will EPA finalize a rule using the existing proposal, or does it plan to withdraw the rule and re-propose the rule? If it is withdrawing and re-proposing, what is the reason?

3. Does EPA believe it will trigger its reset authority? If so, when will this occur? Has EPA started to consider how it might implement its obligations under the reset?

4. In November of last year, EPA issued its proposed 2014 RFS numbers. Since then, the Agency has worked through comments and other public input to the point where it was able to submit a final rule to OMB in August of this year. What issues did OMB raise that were not raised during interagency review prior to the proposed rule? Has anything in the fuels market materially changed since EPA proposed its rule? Have there been any market incidents or trends that could lead to EPA delaying and then possibly changing in a significant way its November 2013 proposal?

5. After EPA's November announcement, it is understood that the final rule will be released after the compliance year is over. What operational flexibility will obligated parties have to retroactively comply?

6. What cost-benefit analysis has EPA performed on the impacts of its options for implementing the RFS?

7. Overall uncertainty in the RFS program has caused price volatility in the RIN market. How does EPA intend to address this issue? Has EPA considered other economic factors, such as what impact this non-decision may have on company obligations under tax and accounting regulations?

8. Please provide copies of all draft and final documents the Agency has prepared relating to EPA's schedule for releasing RVOs for the years 2014, 2015, and 2016.

Questions for Ms. McCabe
Acting Assistant Administrator for Air and Radiation
U.S. Environmental Protection Agency

Questions from Chairman Lankford and Ranking Member Speier
Subcommittee on Energy Policy, Health Care and Entitlements
Committee on Oversight and Government Reform

Hearing on:
"Examining EPA's Management of the Renewable Fuel Standard Program"

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1. We were alarmed by the lack of specifics regarding the release of the renewable fuel standards for 2014, 2015, and 2016. Given that both the 2014 and 2015 standards are already late, we require more information regarding EPA's release plan. Please provide us with a timeline for the years 2015 and 2016, detailing when the EPA will release each Notice of Proposed Rulemaking, and estimating when each Final Rule is planned to be released. Please also provide us with your timeline for finalizing the 2014 rule

2. During the hearing, Ms. McCabe was unable to provide us with specific details regarding why the release of renewable fuel standards has become increasingly delayed. Please provide us with a detailed explanation of how EPA will ensure that future rulemakings occur on schedule. Please also include information on additional resources or authorities that EPA requires in order to release future rulemakings in a timely fashion.

Questions for Ms. McCabe
Acting Assistant Administrator for Air and Radiation
U.S. Environmental Protection Agency

Questions from Congresswoman Duckworth
Subcommittee on Energy Policy, Health Care and Entitlements
Committee on Oversight and Government Reform

Hearing on:
"Examining EPA's Management of the Renewable Fuel Standard Program"

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1. The fact that the RFS rule making has become so unpredictable is chipping away at the credibility of the process and frozen investment in next generation fuels. How does EPA plan to get the program back on track in 2015 and to make rule making timely, predictable and true to the policy goal of blending an increasing amount of biofuels into the nation's motor fuel supply? Can you lay out potential paths forward to ensure that future years provide certainty for biofuels producers?

2. How is the EPA aligning the goals of reducing greenhouse gas emissions, reducing tail pipe emissions, and reducing our dependence on fossil fuels in the transportation sector through the rule making and implementation of the CAFE/Greenhouse Gas Emissions rule, the TIER III emissions reductions rules and the Renewable Fuel Standard as all three have similar goals and should reinforce each other.

3. Independent science and research conducted by national laboratories and universities have documented the significant reductions in greenhouse gas emissions realized from ethanol (40 to 50% reductions) through the Renewable Fuel Standard at a price per gallon which is still less than gasoline. Given the interest by the President and the Administration in reducing greenhouse gas emissions, when will EPA provide industry, the consumers, and the Administration the credit they deserve for these significant reductions? Will EPA consider updating their models that analyze the greenhouse gas emissions associated with ethanol under the RFS?